

**SECTION 23 07 11  
HVAC DUCTWORK INSULATION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Field applied insulation for thermal efficiency and condensation control for ductwork and equipment.

**1.2 SUBMITTALS**

- A. Submit the following:
  - 1. Manufacturers literature and data for insulation specified herein.
  - 2. Method of attachment to ductwork.
  - 3. Sealants, adhesives, mastics and finishing cements.

**1.3 STORAGE AND HANDLING OF MATERIAL**

Store materials in clean and dry environment. Place adhesives in original containers. Maintain ambient temperatures and conditions as required by printed instructions of manufacturers of adhesives, mastics and finishing cements.

**1.6 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.
- B. Military Specifications (Mil. Spec.):
  - MIL-A-3316C (2)-90..... Adhesives, Fire-Resistant, Thermal Insulation
  - MIL-A-24179A (1)-87..... Adhesive, Flexible Unicellular-Plastic Thermal Insulation
- C. American Society for Testing and Materials (ASTM):
  - C411-97 ..... Standard test method for Hot-Surface Performance of High-Temperature Thermal Insulation
  - C449-00 ..... Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement
  - C533-04 ..... Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation

- C553-02 ..... Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
- C612-04 ..... Standard Specification for Mineral Fiber Block and Board Thermal Insulation
- C1126-04 ..... Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation
- E84-06..... Standard Test Method for Surface Burning Characteristics of Building Materials
- E119-05a..... Standard Test Method for Fire Tests of Building Construction and Materials
- D. National Fire Protection Association (NFPA):
  - 96-04 ..... Standards for Ventilation Control and Fire Protection of Commercial Cooking Operations
  - 101-06 ..... Life Safety Code
  - 251-06 ..... Standard methods of Tests of Fire Endurance of Building Construction Materials
  - 255-06 ..... Standard Method of tests of Surface Burning Characteristics of Building Materials
- E. Underwriters Laboratories, Inc (UL):
  - 723 ..... UL Standard for Safety Test for Surface Burning Characteristics of Building Materials with Revision of 08/03

## **PART 2 - PRODUCTS**

### **2.1 MINERAL FIBER INSULATION:**

- A. ASTM C612 (Board, Block), Class 1 or 2,  $k = 0.037$  Watt per meter, per degree C (0.26), external insulation for temperatures up to 204 degrees C (400 degrees F).
- B. ASTM C553 (Blanket, Flexible) Type I, Class B-5, Density  $32 \text{ kg/m}^3$  (2 pcf),  $k = 0.04$  (0.27), for use at temperatures up to 204 degrees C (400 degrees F)

### **2.2 MINERAL WOOL OR REFRACTORY FIBER**

- A. Comply with Standard ASTM C612, Class 3, 450 degrees C (850 degrees F).

## **2.3 INSULATION FACINGS AND JACKETS**

- A. Vapor Retarder, higher strength with low water permeance  $\leq 0.02$  or less perm rating, Beach puncture 50 units for insulation facing on exposed ductwork, casings and equipment. Facings and jackets shall be all service type (ASJ) or PVDC Vapor Retarder jacketing.
- B. ASJ jacket shall be white kraft bonded to 0.025 mm (1 mil) thick aluminum foil, fiberglass reinforced, with pressure sensitive adhesive closure. Comply with ASTM C1136. Beach puncture 5 units, Suitable for painting without sizing. Jackets shall have minimum 40 mm (1-1/2 inch) lap on longitudinal joints and minimum 100 mm (4 inch) butt strip on end joints. Butt strip material shall be same as the jacket. Lap and butt strips shall be self-sealing type with factory-applied pressure sensitive adhesive.
- C. Vapor Retarder medium strength with low water vapor permeance of 0.02 or less perm rating), Beach puncture 25 units: Foil-Scrim-Kraft (FSK) or PVDC vapor retarder jacketing type for concealed ductwork and equipment.

## **2.4 ADHESIVE, MASTIC, CEMENT**

- A. Mil. Spec. MIL-A-3316, Class 2: Adhesive for laps and for adhering insulation to metal surfaces.
- B. Mil. Spec. MIL-C-19565, Type I: Protective finish for outdoor use.
- C. ASTM C449: Mineral fiber hydraulic-setting thermal insulating and finishing cement.
- D. Other: Insulation manufacturers' published recommendations.

## **2.5 MECHANICAL FASTENERS**

- A. Do not puncture existing ductwork.

## **2.6 FLAME AND SMOKE**

- A. Unless shown otherwise all assembled systems shall meet flame spread 25 and smoke developed 50 rating as developed under ASTM, NFPA and UL standards and specifications.

## **PART 3 - EXECUTION**

### **3.1 GENERAL REQUIREMENTS**

- A. Surface shall be clean and dry with all foreign materials, such as dirt, oil, loose scale and rust removed.

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- B. Do not use scrap pieces of insulation where a full length will fit.
- C. Insulation materials shall be installed in a first class manner with smooth and even surfaces.
- D. Insulation shall be firmly applied, joints butted tightly.
- E. At leg supports, fill and thoroughly pack to eliminate water infiltration.

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